CITIZEN

Service Manual

LINE THERMAL PRINTER

MODEL CT-S2000

Rev. 0.00 Issued on April 7, 2006

CITIZEN SYSTEMS JAPAN CO.,LTD.

REVISION

Rev.	Date	Comment
0.00	2006/4/7	Newly issued

CONTENTS

INTRODUCTION 1

1. DISASSEMBLY AND REASSEMBLY 1
1.1 Tools Used 1
1.2 Disassembly Procedure 2
1.2.1 Disassembly of Unit 2
1.2.2 Disassembly of Mechanism 4
1.2.3 Disassembly of SA FRAME and COVER 6
1.2.4 Disassembly of SA HOLDER and PAPER 8
1.3 Reassembly Procedure 8
1.4 Lubrication 9

2. TROUBLESHOOTING 10
2.1 Troubleshooting Procedure 10
2.2 Troubleshooting Guide 10

3. SERVICE PARTS LIST 14
3.1 Parts List for Mechanism 14
3.2 Exploded View of Mechanism 17
3.3 List of Electric Parts 21
3.4 Parts Configuration 23
3.4.1 Main Control Board 23
3.4.2 Serial Interface Board 24
3.4.3 Parallel Interface Board 25

4. CIRCUIT DIAGRAM 26
4.1 Main Control Board 26
4.2 Serial Interface Board 27
4.3 Parallel Interface Board 28

INTRODUCTION

This manual describes the disassembly, reassembly, and maintenance procedures of the line thermal printer CT-S2000.

1. DISASSEMBLY AND REASSEMBLY

Notes the following items when maintaining the printer.

- Do not disassemble, reassemble, or adjust the printer unnecessarily when the printer operation is satisfactory.
- Do not loosen the screws fixing each component carelessly.
- After finishing inspection, perform checking for normality before turning on the printer.
- Pay attention not to leave the part or screws used for maintenance inside the printer.
- When handling the print head and electronic components, pay attention to static electricity.
- When disassembling or reassembling the printer, check the wiring and cord for damage. Pay attention not to lay the wiring and cord by force.
- Lubricate the components as necessary when reassembling them.

1.1 Tools Used

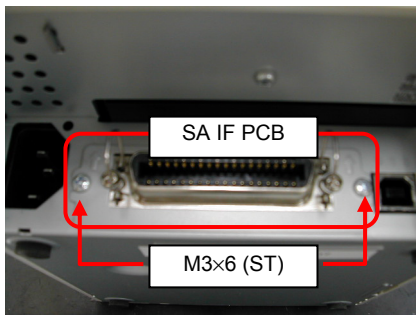
- Phillips screwdriver #0, #1, and #2
- Tweezers
- Long-nose pliers
- Oil brush
- Nipper

1.2 Disassembly Procedure

1.2.1 Disassembly of Unit

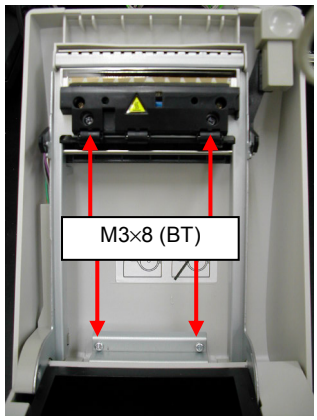
(1) Removing SA IF PCB

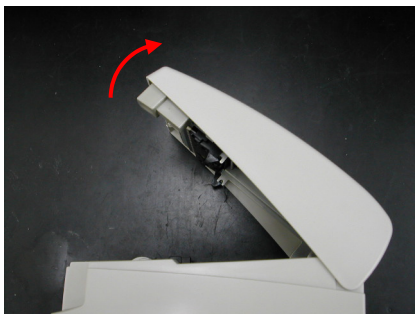
- Remove two screws M3×6 (ST).
- Pull out the SA IF PCB.
  (Insert normally the connector when re-assembled)



(2) Removing COVER

- Open COVER and remove four screws M3×8 (BT).
- Holding the front COVER, rotate it upward and remove the rear hook so that COVER is taken away.
  (In reassembly, be careful not to be pinched by harness)

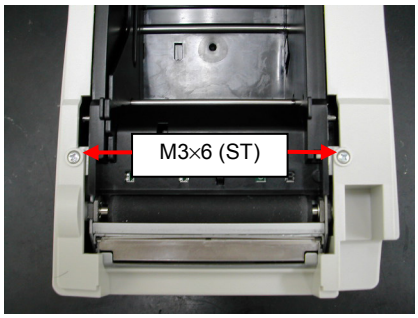


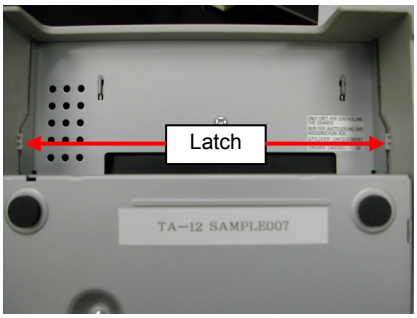


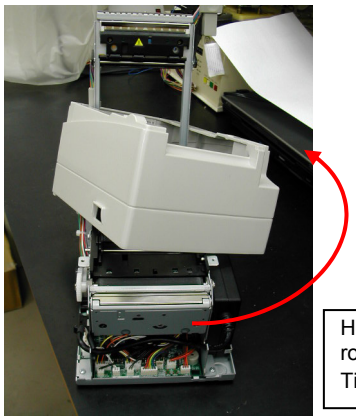
If COVER is fully opened, you may fail to remove the rear hook.

(3) Removing CASE

- Remove two screws M3×6 (ST).
- From two latches at the rear bottom of CASE, remove FRAME and BOTTOM.
- Removing the hook of power switch, lift the front. Remove the entire CASE by declining it.
- Finally, rotate it horizontally and remove the unit by moving it through KNOB and OPEN portions.



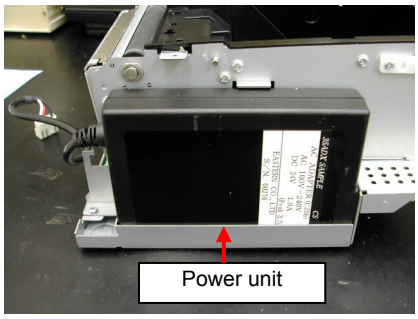


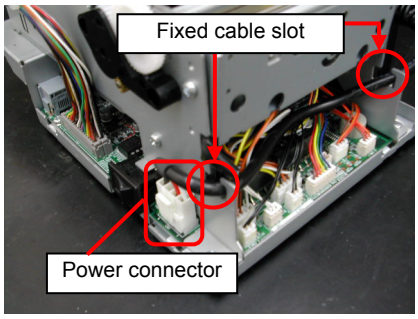


Holding the front to slant the unit, rotate it for removing.
Tip: Move **CASE** three-dimensionally.

(4) Removing Power Unit

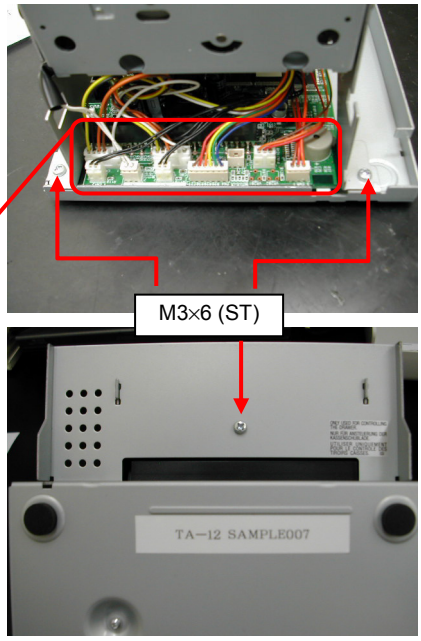
- Remove the power connector on the UNIT MAIN PWB. (Be sure to remove the connector lock in advance)
- After removing the cable from fixed cable slot, remove the power unit.



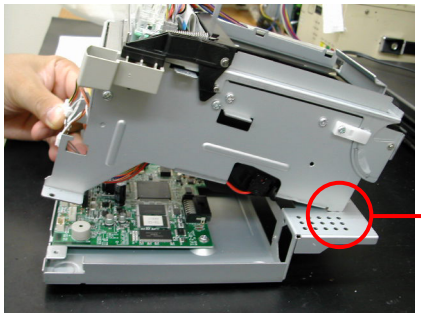


(5) Removing the mechnizam unit

- Remove three screws M3×6 (ST). (Two locations at top front, one at the rear bottom)
- Remove all connectors on UNIT MAIN PWB.
- Lifting the front portion, remove hooking at FRAME and BOTTOM squre holes. Then, remove mechanism unit.

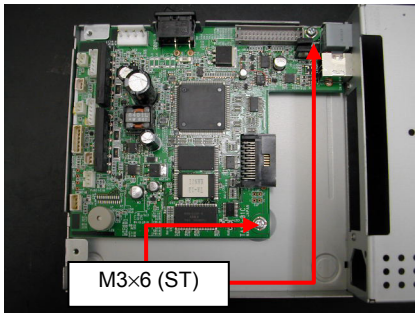


- Mark connectors before removing for identification since same connectors may be used.
- Be careful to remove another connector that is additionally located at the left side.



(6) Removing UNIT MAIN PWB

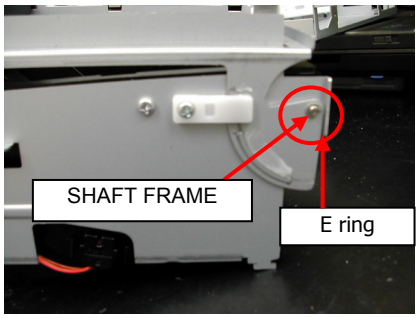
- Remove two screws M3×6 (ST).
- Remove power switch from switch guides on FRAME and BOTTOM, then remove UNIT MAIN PWB.



1.2.2 Disassembly of Mechanism

(1) Removing SA FRAME and COVER

- Remove E ring at the rear right side.
- Remove SHAFT and FRAME, then SA FRAME and COVER.

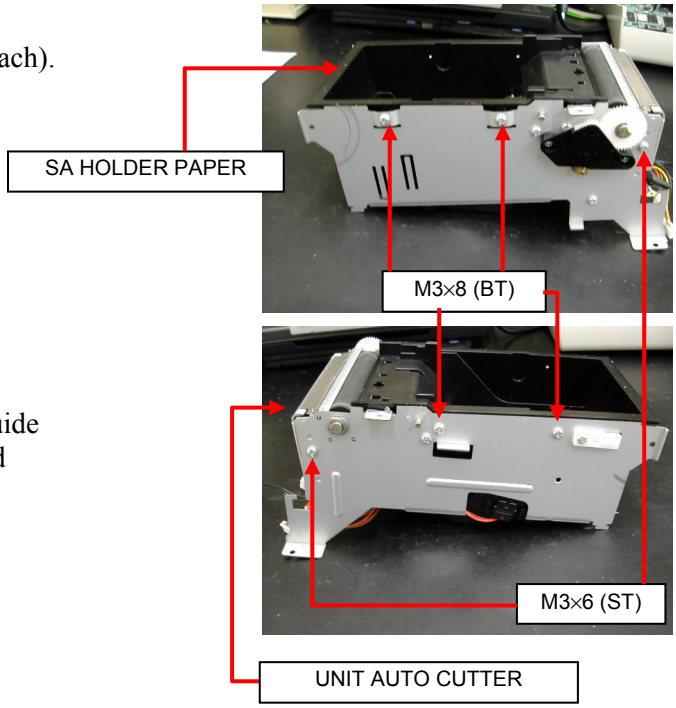


(2) Removing SA HOLDER and PAPER

- Remove four screws M3×8 (BT) (Left/right, two each).
- Remove SA HOLDER and PAPER.

(3) Removing UNIT and AUTO CUTTER

- Remove two screws M3×6 (ST) at both sides.
- Widen FRAME and MAIN slightly and remove guide bosses at four locations. Then, remove UNIT and AUTO CUTTER.

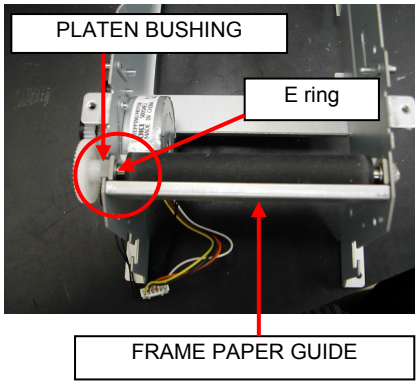


(4) Removing FRAME and PAPER GUIDE

- Widen FRAME and MAIN slightly and remove guide tabs at four locations. Then, remove FRAME and PAPER GUIDE.

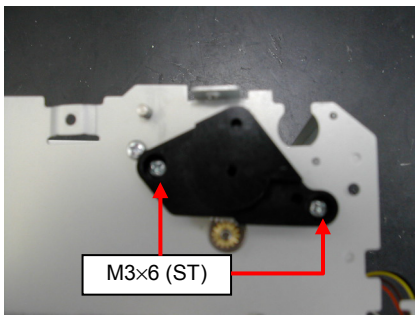
(5) Removing SA PLATEN

- Remove one E ring at the inner right (See Figure).
- Move the left PLATEN BUSHING toward rubber roller, and remove it from FRAME and MAIN.
- Lift the left portion side (PLATEN GEAR side) and remove the PLATEN BUSHING at right side.
- Remove SA PLATEN.



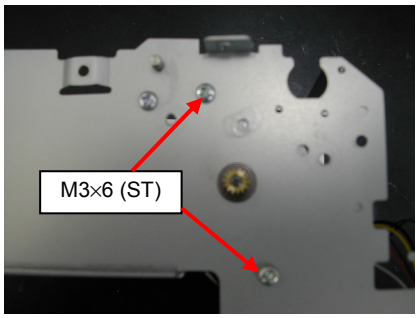
(6) Removing GEAR

- Remove two screws M3×6 (ST).
- Remove GEAR HOLDER, REDUCTION GEAR and IDLE GEAR.



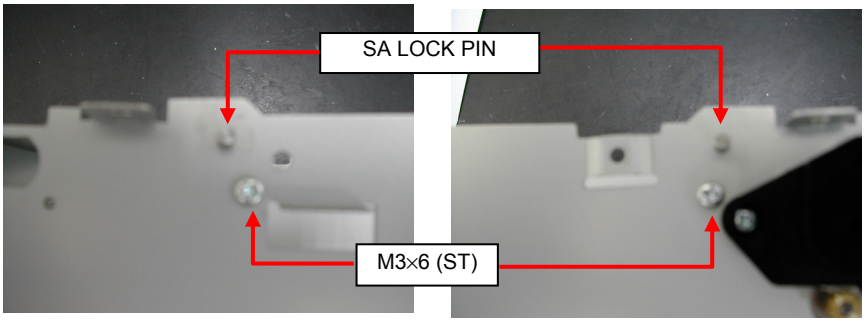
(7) Removing SA and MOTOR

- Remove two screws M3×6 (ST) then SA and MOTOR.



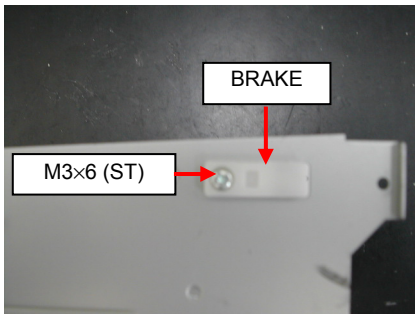
(8) Removing SA and LOCK PIN

- Remove two screws M3×6 (ST) at both sides.
- Remove SA and LOCK PIN at two locations.



(9) Removing BRAKE

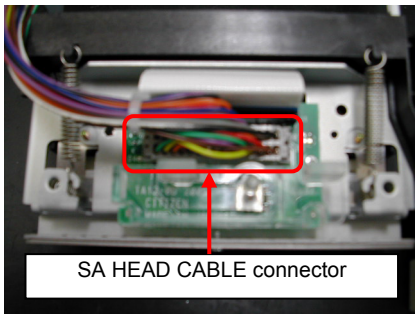
- Remove one screw M3×6 (ST) then BRAKE.

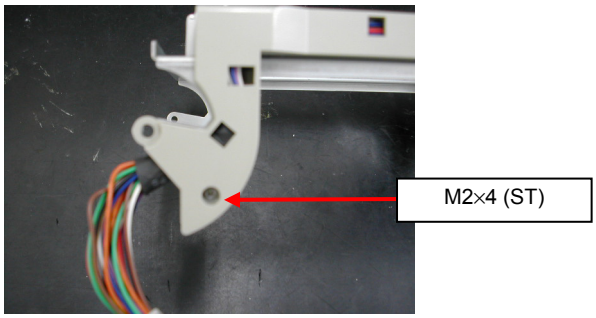


1.2.3 Disassembly of SA FRAME and COVER

(1) Removing SA HEAD CABLE, COVER and CABLE

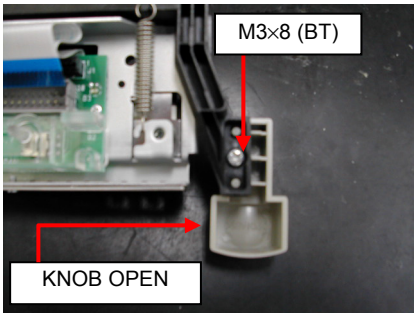
- Remove SA HEAD CABLE connector.
- Remove the screw M2×4 (ST), which fix COVER and CABLE.
- Disassemble into FRAME, COVER, COVER, CABLE and SA HEAD CABLE.





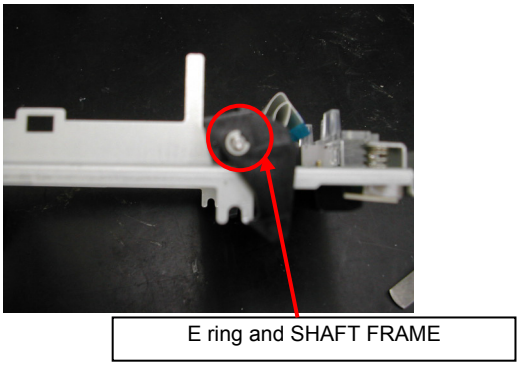
(2) Removing KNOB and OPEN

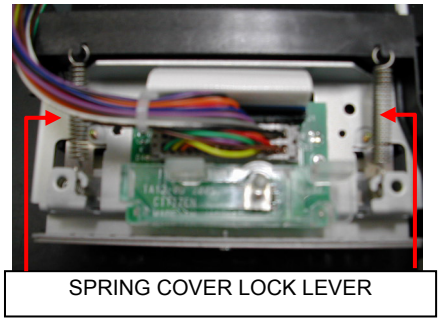
- Remove the screw M3×8 (BT), then KNOB and OPEN.



(3) Removing LEVER and COVER LOCK

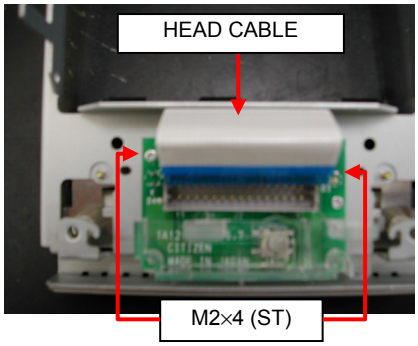
- Remove SPRING and COVER LOCK LEVER (two).
  (Remove from FRAME and COVER sides)
- Remove one E ring at each side then remove SHAFT and FRAME.
- Remove LEVER and COVER LOCK.

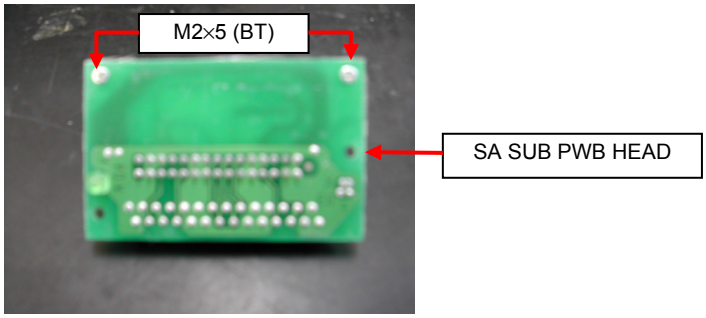




(4) Removing SA SUB PWB HEAD, CONDUCTOR and LED

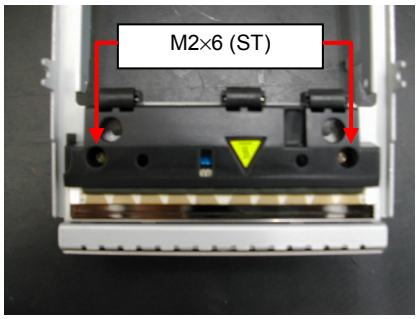
- Remove HEAD CABLE (FFC).
- Remove two screws M2×4 (ST).
- Remove SA SUB PWB HEAD (with CONDUCTOR, LED).
- Remove two screws M2×5 (BT).
- Disassemble SA SUB PWB HEAD from CONDUCTOR and LED.

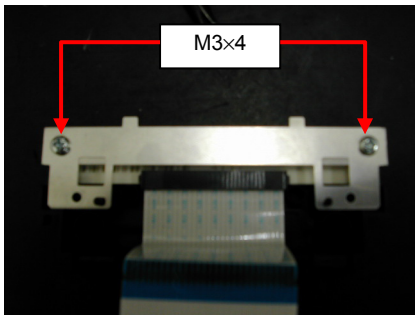




(5) Removing SA COVER, HEAD and SA THARMAL HEAD

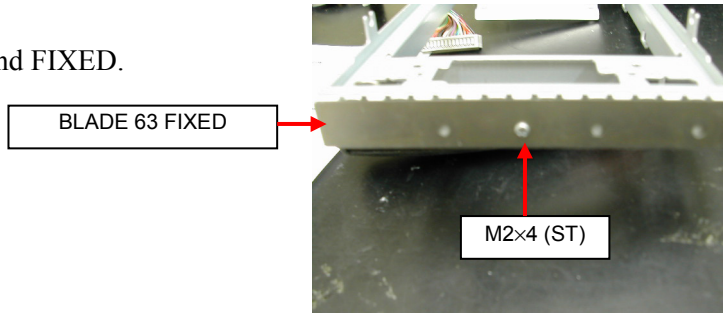
- Remove two screws M2×6 (ST).
- Remove SA COVER, HEAD and SA THARMAL HEAD.
  (Be sure not to lose two HEAD SPRINGs)
- Remove two screws M3×4.
- Disassemble THARMAL HEAD from PLATE and HEAD.
- As necessary, remove HEAD CABLE (FFC) from THARMAL HEAD.





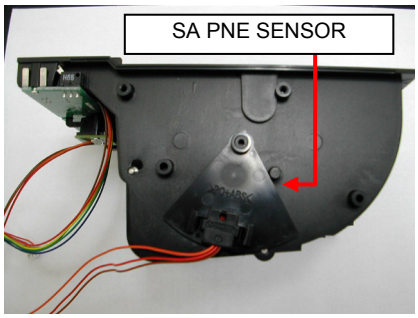
(6) Removing BLADE 63 and FIXED

- Remove M2×4 (ST) screw then BLADE 63 and FIXED.

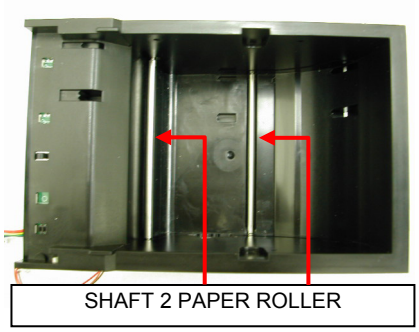


1.2.4 Disassembly of SA HOLDER and PAPER

(1) Remove SA PNE SENSOR.

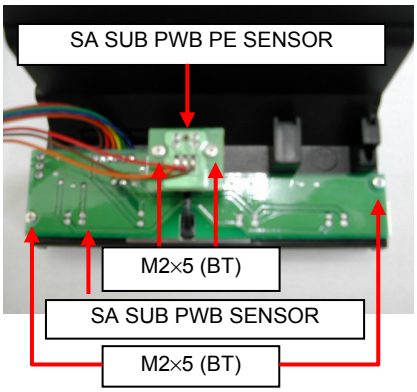


(2) Remove SHAFT 2 and PAPER ROLLER (two).



(3) Remove two screws M2×5 (BT), then SA SUB PWB PE SENSOR.

(4) Remove two screws M2×5 (BT), then SA SUB PWB SENSOR.



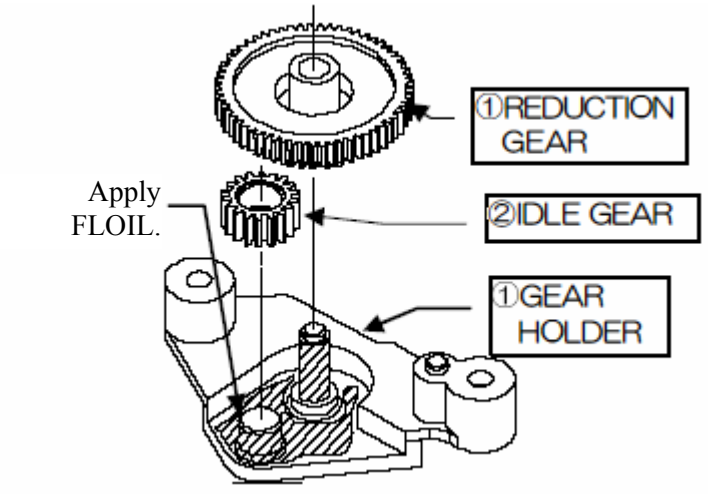
1.3 Reassembly Procedure

Reverse the procedure in “1.2 Disassembly Procedure”.

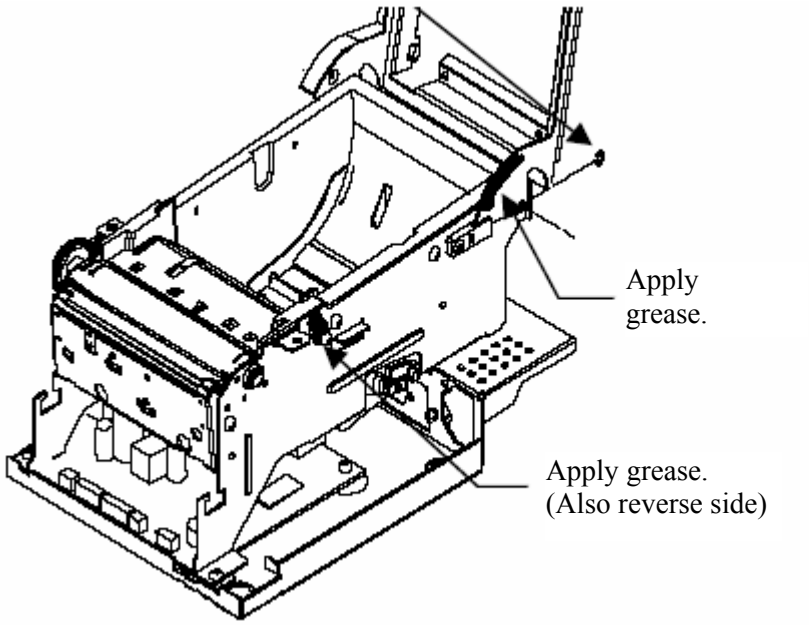
1.4 Lubrication

(1) Oil (Grease)
Furoyll G-943 (Kanto Kasei Co., Ltd.)

(2) Lubrication points
Gear Holder
Frame Cover
Lock Pin



Location for applying 1. Gear Holder



Location for applying 2. Frame Cover and Lock Pin

2. TROUBLESHOOTING

2.1 Troubleshooting Procedure

When a trouble occurs, confirm its phenomenon, locate a defective part in accordance with "2.2 Troubleshooting Guide", and troubleshoot as described below.

Phenomenon	Find a trouble phenomenon in this column. If there are multiple phenomena, take all the corresponding items into consideration to locate hidden defective parts.
Cause	Lists as many possible causes as possible. Guess a trouble cause out of them and take its check method to specify the trouble cause.
Check Method	Describes a check method to specify a trouble cause.
Remedy	Troubleshoot by taking a remedy described in this column.

By troubleshooting in accordance with the above-mentioned procedure, you can troubleshoot efficiently with fewer misjudgments.

2.2 Troubleshooting Guide

• Power Supply Failure

Phenomenon	Cause	Check Method	Remedy
No power (POWER lamp not illuminated)	The AC cable is not connected.	—	Connect AC cable.
	The fuse is gone.	Check whether the specified fuse is used.	Use the specified fuse.
The fuse immediately goes again after replacing with a new one.	Faulty control PCB assy	—	Replace the control PCB assy.
	The circuit drive power is abnormal.	Use instruments such as tester to measure circuit driving voltage.	Replace the control PCB assy.

* If the fuse is gone with the specified AC adapter used, it is likely that the thermal head unit or control PCB assy is defective. Replace either defective one. Check wiring for drawer cable and interface cable.

• Printing failure

Phenomenon	Cause	Check Method	Remedy
No printing	Faulty control PCB assy	—	Replace the control PCB assy.
	Failed contact/connection of thermal head connector	Check contact/connection condition.	Re-insert thermal head connector.
	Faulty thermal head	—	Replace the thermal head.
Partly not printed	Faulty contact/connection in thermal head connector	Check contact/conection conditions.	Re-insert thermal head connector.
	Faulty thermal head	—	Replace the thermal head.
Faint printout or uneven printout	Low output voltage	Check the supply voltage with tester or others.	Use within specified voltage range.
	Faulty thermal head	—	Replace the thermal head.
	Foreign substance is adhered to the thermal head.	Check whether any foreign substances are adhered to the head.	Wipe foreign materials with swab or soft cloth immersed with ethyl alcohol.
	Non-recommended paper is used.	Check whether the paper being used meets the specification.	Replace it with the specified paper.
	Faulty mounting of the platen roller	Check mounting condition of the platen roller.	Mount the platen roller properly.

• Paper feed failure

Phenomenon	Cause	Check Method	Remedy
Paper is not fed or jammed.	Faulty connection of the motor connector	Check the connector connection.	Connect the connector correctly.
	Failed motor's main unit	Use tester or oscilloscope or other instrument to measure supply voltage.	If the supply voltage is normal, replace the motor.
	Low output voltage	Check the supply voltage with tester or others.	Use within specified voltage range.
	Faulty control PCB assy	—	Replace the control PCB assy.
	Faulty mounting of the platen roller	Check mounting condition of the platen roller.	Mount the platen roller properly.
	Paper feed failure	Check that no paper is jammed, torn or caught in the paper path.	Remove unnecessary paper and set correctly.
	Foreign substance in the gear or broken gear	Remove the gear holder and check for any foreign substance caught in the gears or any breakage of the gears.	Eliminate the foreign substance. If the gear is broken, replace it with new one.

• Faulty sensor

Phenomenon	Cause	Check Method	Remedy
Failed detection of paper feed Failed detection of paper's near-end	Faulty paper sensor	Check whether the ERROR LED flickers if paper expires.	Replace the SA SUB PWB PE SENSOR.
	Faulty paper near-end sensor		Replace the SA PNE SENSOR.
	Foreign substance is attached to the paper sensor	Check whether any foreign substances are adhered to the paper sensor.	Remove the foreign substance.
	Faulty connection of the paper sensor connector	Check the connector connection.	Connect the connector correctly.

- **Faulty auto cutter**

Phenomenon	Cause	Check Method	Remedy
No operation of auto-cutter	Faulty connection of the auto cutter connector	Check the connecting condition of the auto cutter connector.	Connect the connector correctly.
	Failure in auto-cutter's main unit	Use tester or oscilloscope or other instrument to measure supply voltage.	If the supply voltage is normal, replace the auto cutter.
	Paper feed failure (Paper jam)	Check that no paper is jammed, torn or caught in the paper path.	Remove unnecessary paper and set correctly.

3. SERVICE PARTS LIST

3.1 Parts List for Mechanism

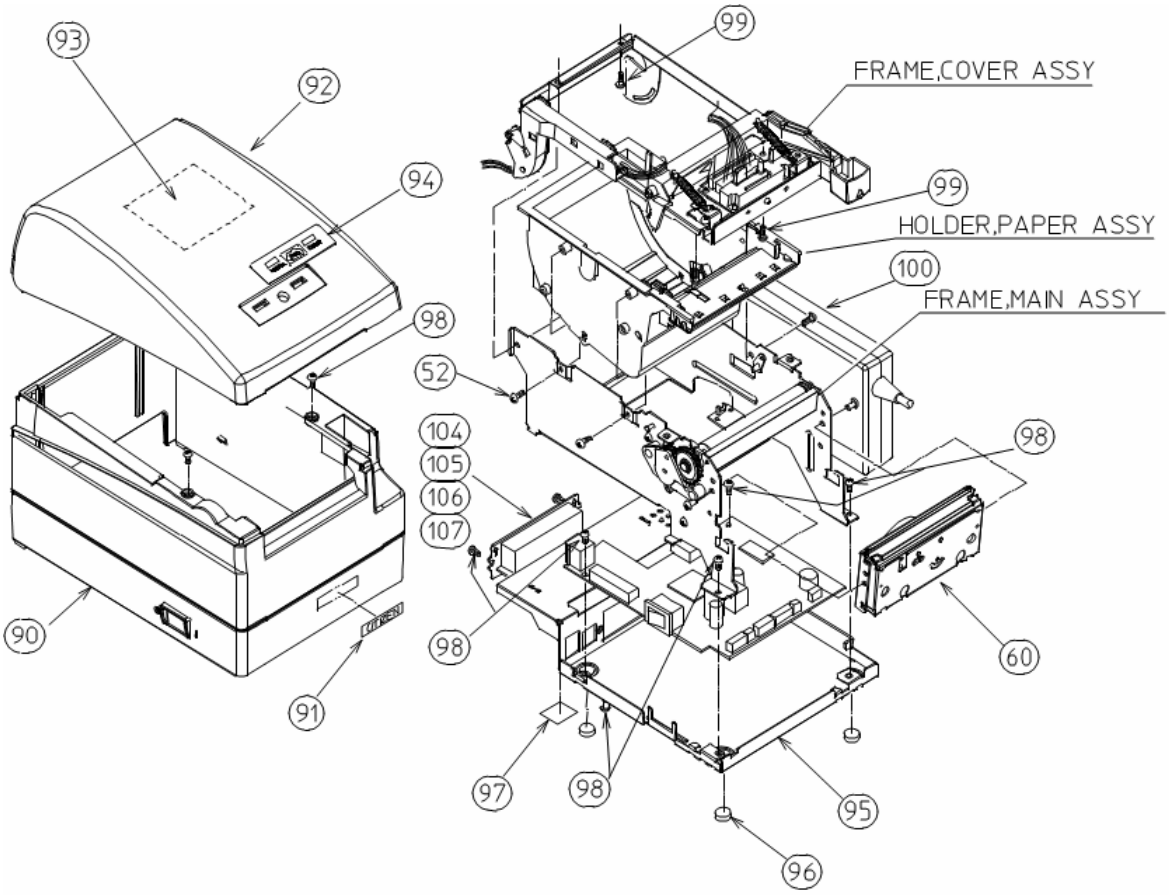
No.	Part No.	DESCRIPTION	Q T Y	REMARKS
FRAME COVER ASSY				
1	TA44103-01F	FRAME COVER	1	
2	TA66706-00F	HEAD PCB ASSY	1	
3	TA56204-00F	CONDUCTOR LED	1	
4	KF2003-GF48B	Thermal Head KF2003-GF48B	1	
5	TA44202-00F	LEVER COVER LOCK	1	
6	TA44203-00F	COVER HEAD	1	
7	80-0276	CAUTION LABEL, HOT	1	
8	TA44204-00F	COVER CABLE	1	
9	60-0241	ROLLER	3	
10	TA22001-00F	SHAFT 1 PAPRE ROLLER	3	
11	700021-00	HEAD SP	2	
12	TA43601-00F	SPRING COVER LOCK LEVER	2	
13	TA67701-00F	HEAD CABLE ASSY	1	
14	25-0347	FFC	1	
15	TA42001-00F	SHAFT FRAME	1	
16	TA04101-00F	PLATE HEAD	1	
17	TA56203-00F	KNOB OPEN	1	
18	TA24102-00F	BLADE 63 FIXED	1	
19	F60120-00	E-ring,2	2	
20	F11130-08	SCREW PHT(BT) +M3X8	1	
21	F16320-05	SCREW No.0 PHT(BT# 1) +M2X5	2	
22	F00130-04	SCREW PHT(ST) +M3X4	2	
23	F15620-06	SCREW (ST) +M2X6 BIND	5	
24	F14520-04	SCREW PHT(ST) +M2X4 BIND	1	

No.	Part No.	DESCRIPTION	Q T Y	REMARKS
FRAME MAIN ASSY				
30	TA44101-01F	FRAME MAIN	1	
31	TA28702-00F	SA PLATEN ASSY	1	
36	60-0281	BRAKE	1	
37	60-0272	REDUCTION GEAR	1	
38	60-0273	IDLE GEAR	1	
39	60-0274	GEAR HOLDER	1	
40	TA44104-00F	FRAME PAPER GUIDE	1	
41	TA42001-00F	SHAFT FRAME	1	
42	F60120-00	E-ring,2	2	
43	TA25702-00F	MOTOR ASSY	1	
46	F60440-00	E-ring,4	1	
47	TA44701-00F	PLATE LOCK PIN ASSY	2	
50	F10230-06	SCREW PHT(ST) +M3X6	7	
51	F00130-08	SCREW PHT(ST) +M3X4	2	
52	F11130-08	SCREW PHT(BT) +M3X8	4	
60	ACS-631	ACS-631	1	

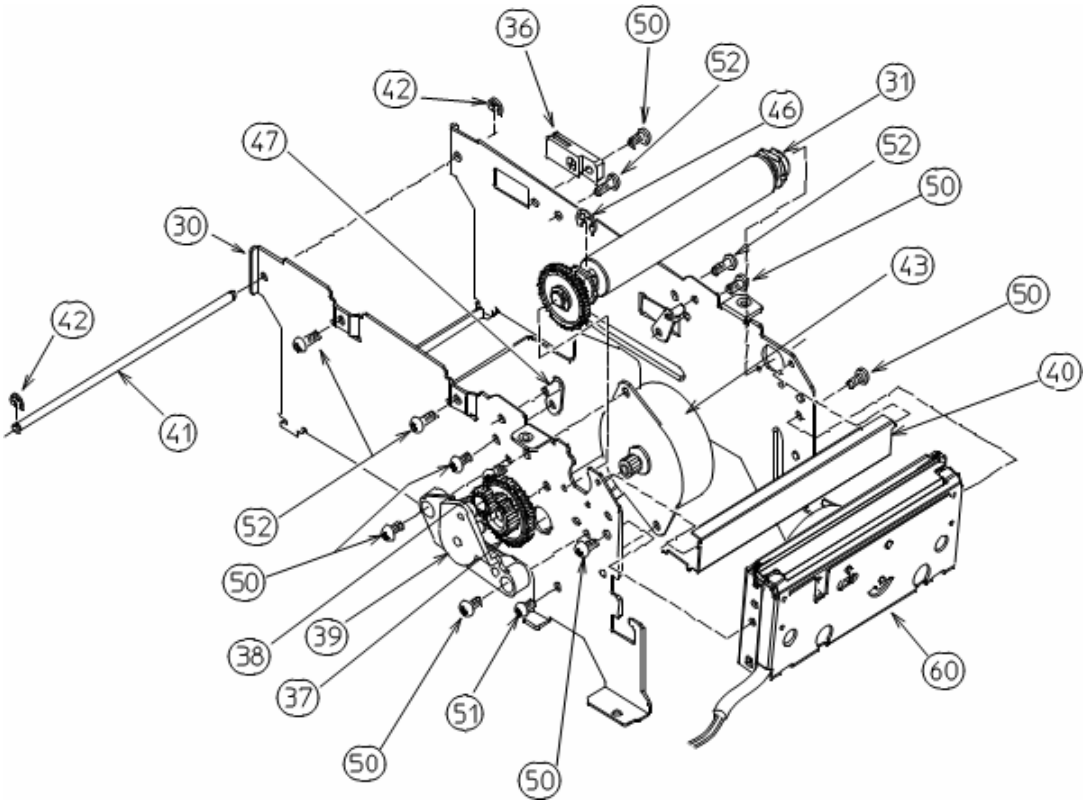
No.	Part No.	DESCRIPTION	Q T Y	REMARKS
HOLDER PAPER ASSY				
70	TA44201-00F	HOLDER PAPER	1	
71	TA24701-00F	HOLDER_PE_SENSOR_ASSY	1	
75	TA22002-00F	SHAFT 2 PAPER ROLLER	2	
76	F18120-08	SCREW PHT(BT) +M2X8	2	
77	F16320-05	SCREW No.0 PHT(BT# 1) +M2X5	2	
78	TA66704-00F	SENSOR PCB ASSY	1	
79	TA66708-00F	PE SENSOR PCB ASSY	1	
80	TA44701-00F	HOLDER PNE SENSOR ASSY	1	
84	TA44105-00F	PLATE PE SENSOR	1	
85	TA63102-00F	SHEET BM SENSOR	1	
86	TA44112-01F	SHEET,PAPER HOLDER	1	
87	TA44205-00F	PARTITION PAPER	1	
90	TA56201-00F	CASE WH	(1)	WHITE
	TA56210-00F	CASE BK	(1)	BLACK
	TA56217-00F	CASE GR	(1)	GRAY
97	F10230-06	SCREW PHT(ST) +M3X6	9	
98	F11130-08	SCREW PHT(BT) +M3X8	4	
102	TA66801-00F	S2000 EUR Main ASSY	(1)	
	TA66801-40F	S2000 USA Main ASSY	(1)	
	TA66801-10F	S2000 JPN Main ASSY	(1)	
103	TA66709-00F	SA SUB PWB POWER ASSY	(1)	DC type
104	TA66811-00F	UNIT SUB PWB I/F PARALLEL	(1)	Parallel
105	TB66832-00F	UNIT SUB PWB I/F SERIAL(INCH)	(1)	Serial
106	TB66831-00F	UNIT SUB PWB I/F SERIAL(MM)	(1)	Serial
107	TA54107-00F	PLATE,I/F COVER	(1)	USB

3.2 Exploded View of Mechanism

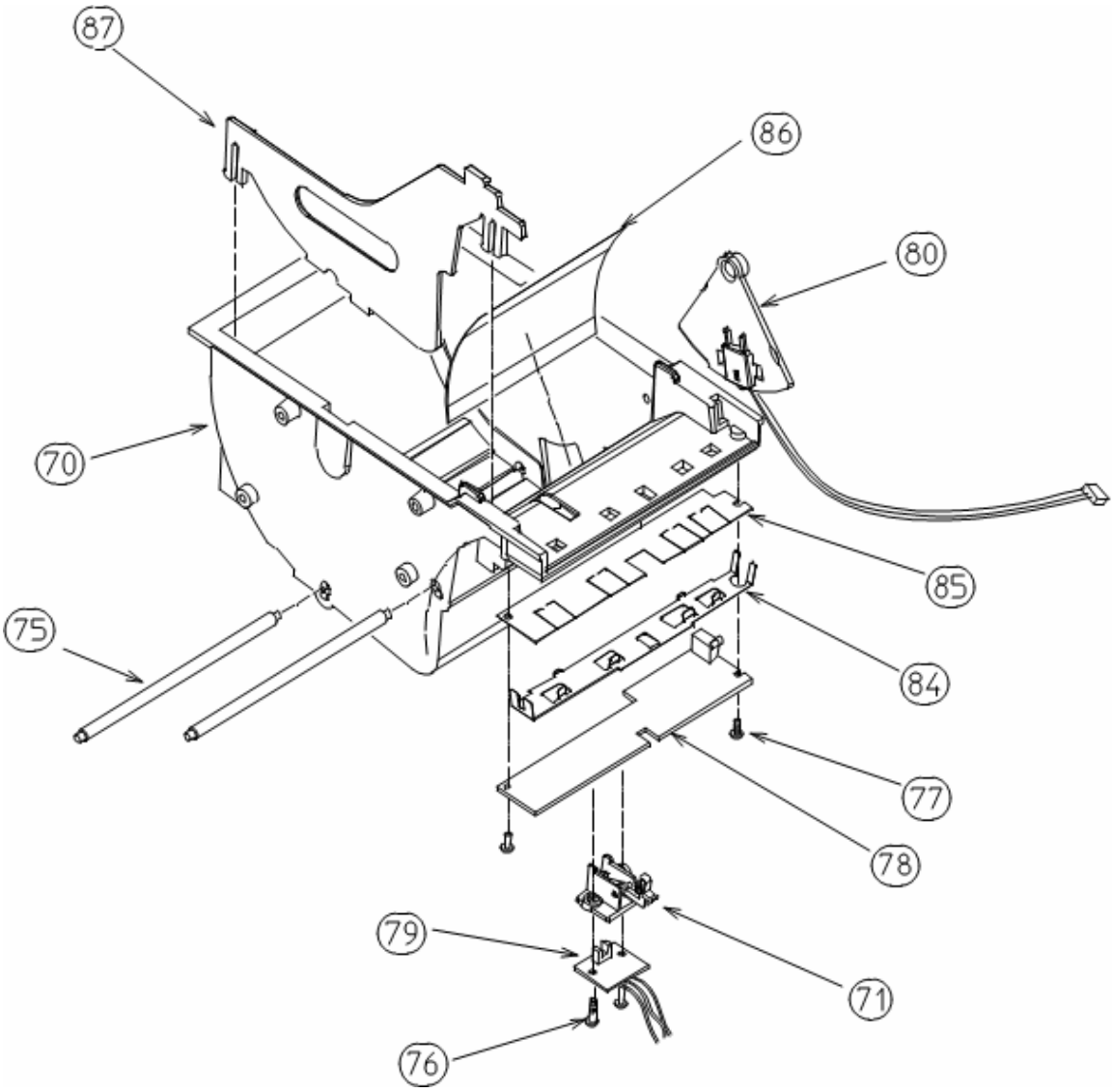
Exploded View-1



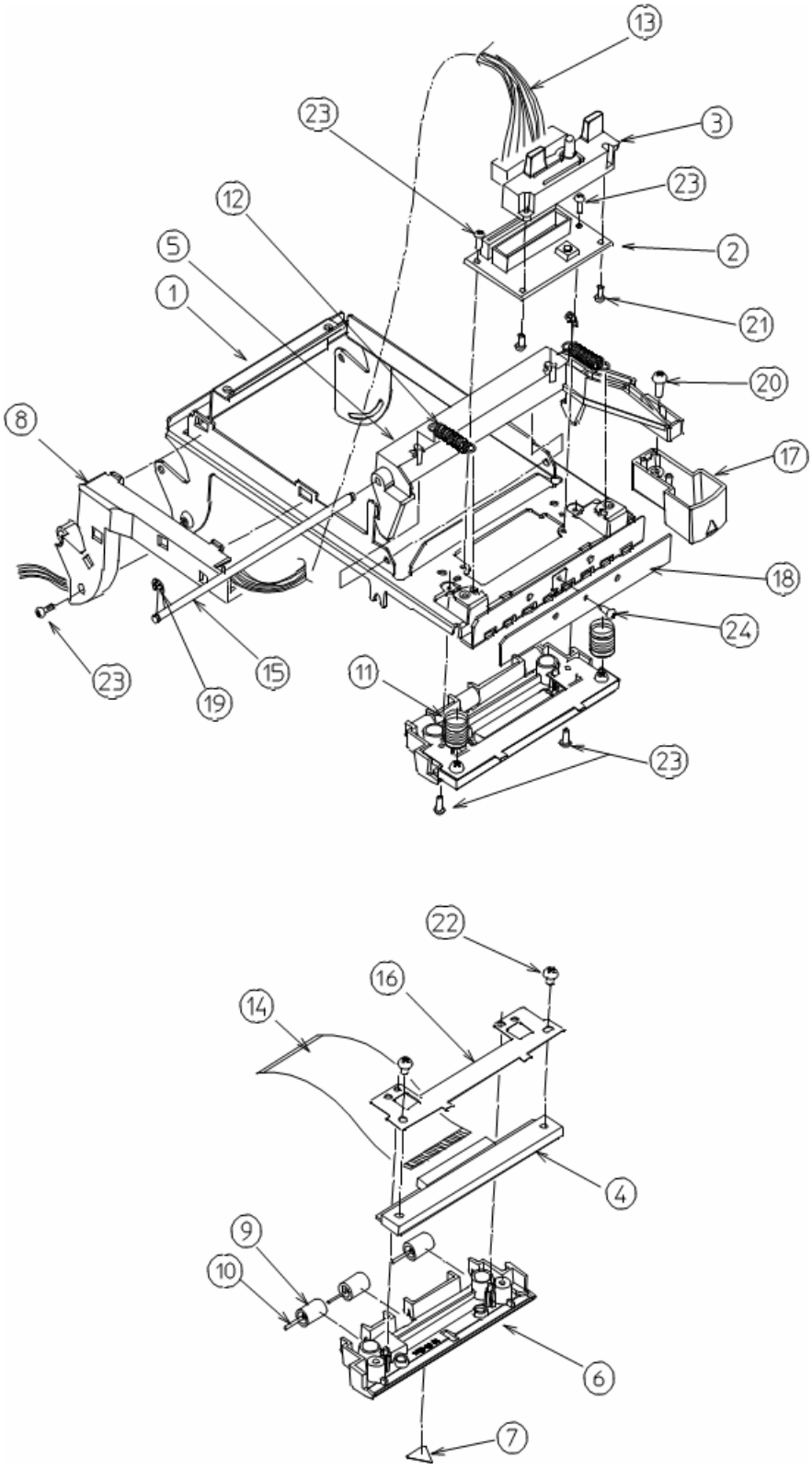
Exploded View-2



Exploded View-3



Exploded View-4



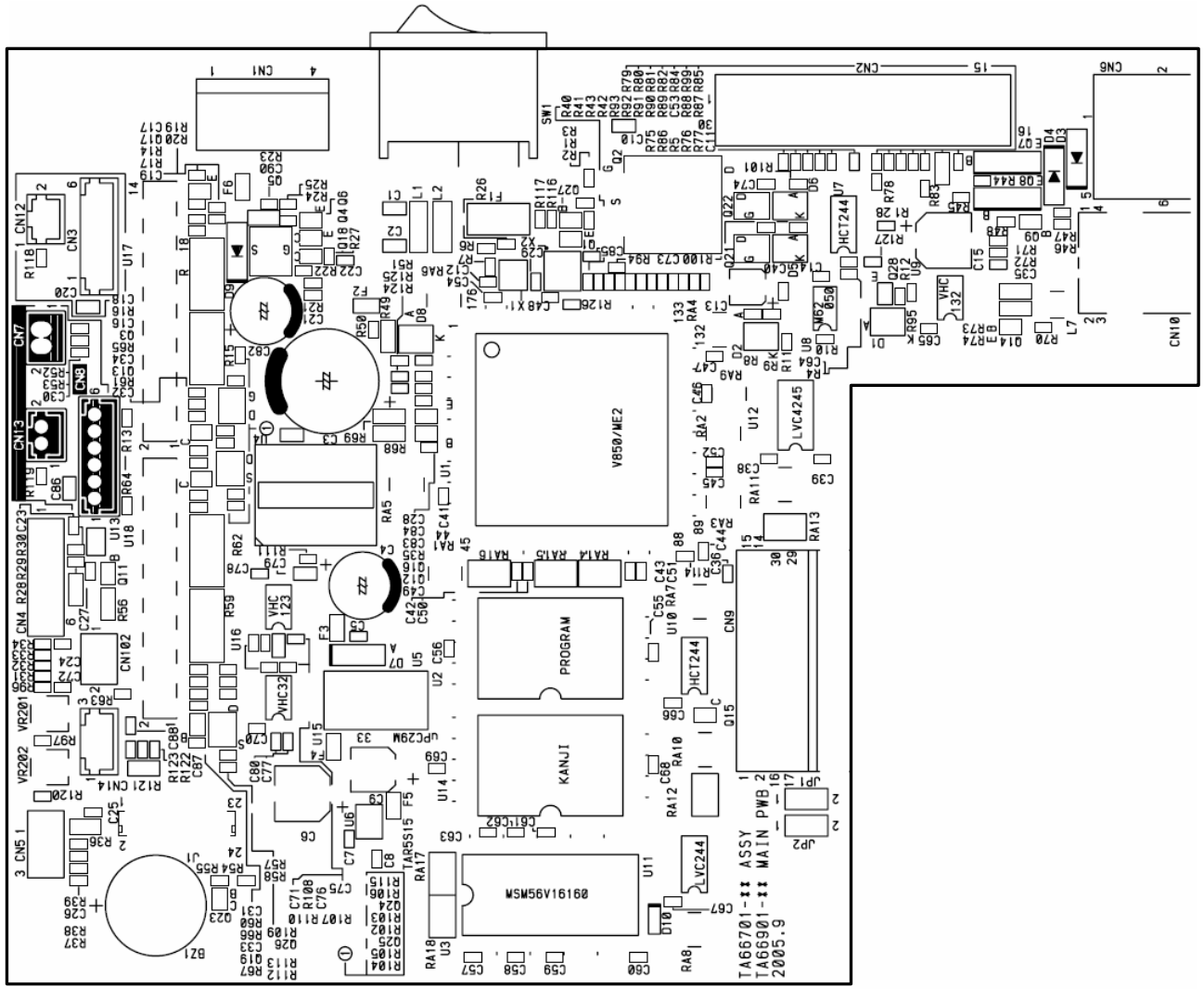
3.3 List of Electric Parts

MARK	PART NO.	PART NAME	DESCRIPTION	QTY	REMARK
U1	C2400-037#	CPU	UPD703111AGM-10-UEU-A	1	
U2,(14)	C2308-082#	Flash Memory	TC58FVM5B2ATG65BAH	1	
U3	C2330-934#	SDRAM	M12L16161A-7TG	1	
U4	C2800-046#	DC/DC Converter	SI-8401L	1	
U5	C2800-144#	Regulator	UPC29M33AT-AZ	1	
U6	C2800-109#	Regulator	TAR5S15(TE85L.F)	1	
U7,10	C2256-093#	HCMOS	SN74AHCT244PWR	1	
U8	C2900-155#	RESET-IC	M62050FP-TF0J	1	
U9	C2256-091#	HCMOS	TC74VHC132FT(EL.K)	1	
U11	C2256-090#	HCMOS	TC74VHC244FT(EL.K)	1	
U12	C2256-092#	CCMOS	SN74LVC4245APWR	1	
U13	C2206-015#	LMOS	TC7S08FU(TE85L F)	1	
U15	C2256-089#	HCMOS	TC74VHC32FT(EL.K)	1	
U16	C2256-088#	HCMOS	TC74VHC123AFT(EL.K)	1	
U17,18	C2701-001#	Transistor Array	SMA7029M	2	
Q1,4,11,12,16	C3905-078#	Transistor	DTC114EMT2L	5	
Q2	C3903-114#	Transistor	2SJ549STL-E	1	
Q3,6,13,15,17-19	C3905-079#	Transistor	DTC143TMT2L	7	
Q5	C3903-115#	Transistor	2SJ518AZTR-E	1	
Q7,8	C3303-786#	Transistor	2SC3786	2	
Q9,23,27	C3305-658#	Transistor	2SC5658T2L	3	
Q14,28	C3905-080#	Transistor	DTA114EMT2L	1	
Q21,22,24-26	C3903-085#	Transistor	2SK1133-T1B-A/JM	5	
D1,2,5,6	C3610-024#	Diode	1SS193(TE85L.F)	4	
D3,4,9	C3600-141#	Diode	D1F20-5063	3	
D7	C3750-172#	Zenner Diode	RD6.2FM-T1-AZ B2	1	
D8	C3750-173#	Zenner Diode	RD3.0MB-T1B B2 or B1	1	
D10	C3600-141#	Diode	RB521S-30TE61	1	

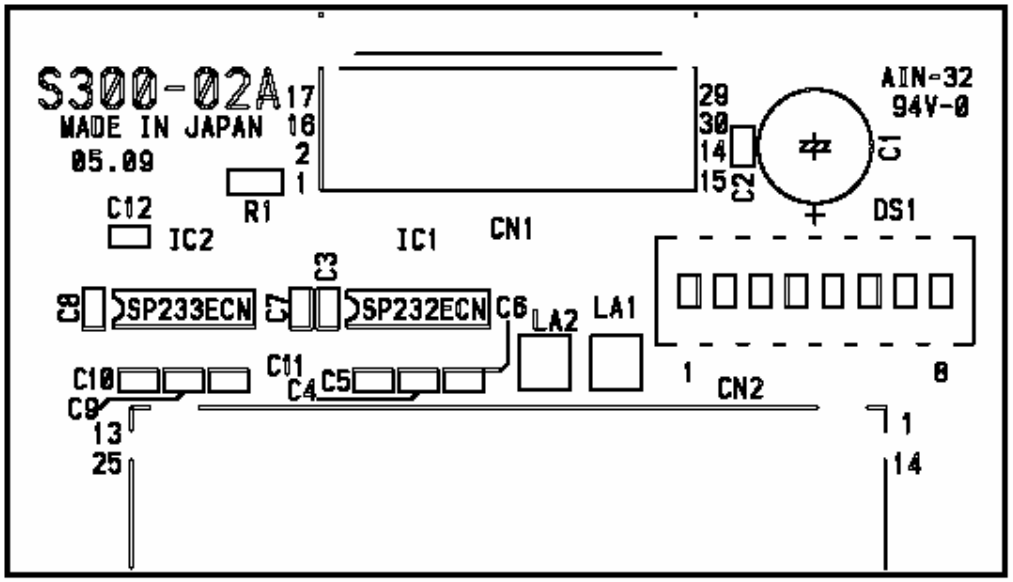
MARK	PART NO.	PART NAME	DESCRIPTION	QTY	REMARK
F1	C7302-423#	Fuse	0453010.MR 1K/L	1	
F2	C7302-413#	Fuse	0467002.NR	1	
F3	C7302-419#	Fuse	0467.500NR	1	
BZ1	C7900-115#	Buzzer	MEB-12S-5	1	
X1	C7400-008#	X'tal	CSTCE12M5G55-R0	1	
X2	C7485-486#	X'tal	FCXO-03L(48MHZ)	1	
CN1	C6199-904#	Connector	B4P-VH(LF)(SN) 1K/L	1	
CN2	C6190-052#	Connector	53313-3065 560/L	1	
CN3,8	C6196-706#	Connector	B6B-PH-K-S(LF)(SN)	2	
CN4	C6190-046#	Connector	53014-0610	1	
CN5	C6190-055#	Connector	53014-0310	1	
CN6	C6179-030#	Connector	9667 6P6C	1	
CN7	C6190-053#	Connector	53014-0210	1	
CN9	C6149-167#	Connector	DHB-PA30-R131N-FA	1	
CN10	C6149-159#	Connector	DSUB-BRA42T11-FA	1	
CN12,13	C6196-702#	Connector	B2B-PH-K-S(LF)(SN)	2	
CN14	C6196-703#	Connector	B3B-PH-K-S(LF)(SN)	1	
SW1		Switch	SF-W1P1A-01BB	1	

3.4 Parts Configuration

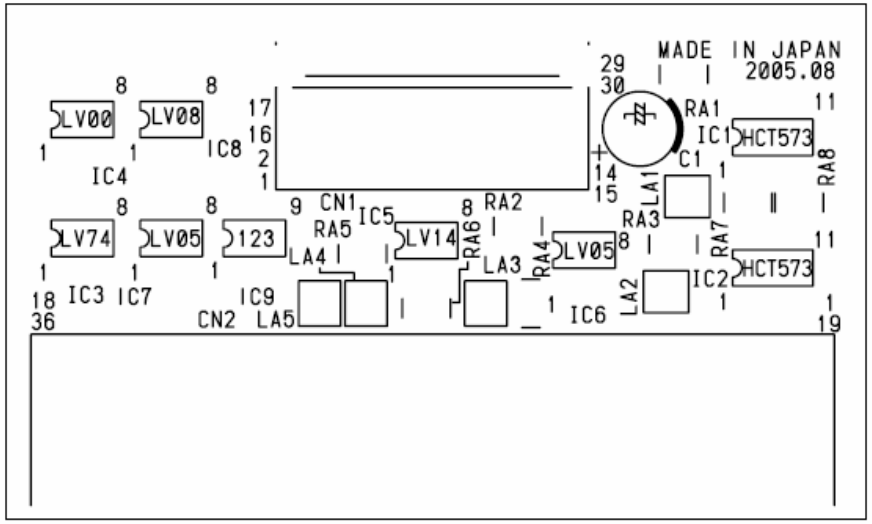
3.4.1 Main Control Board

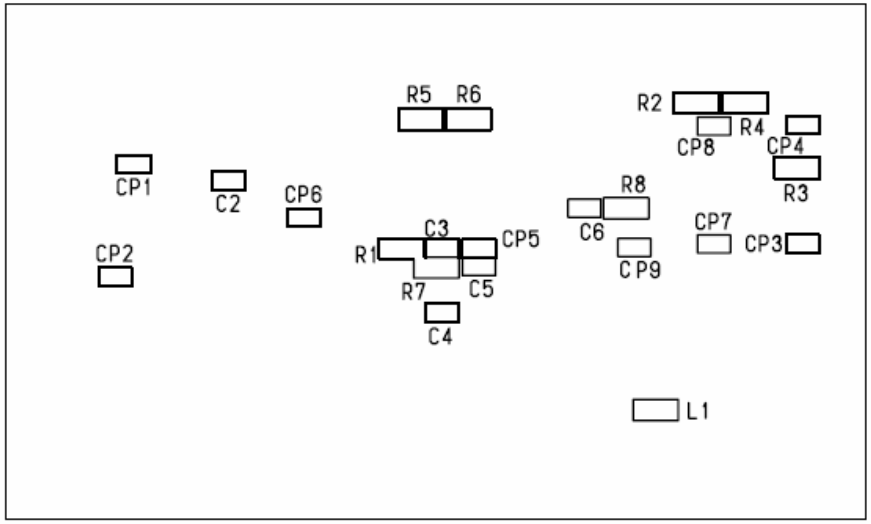


3.4.2 Serial Interface Board



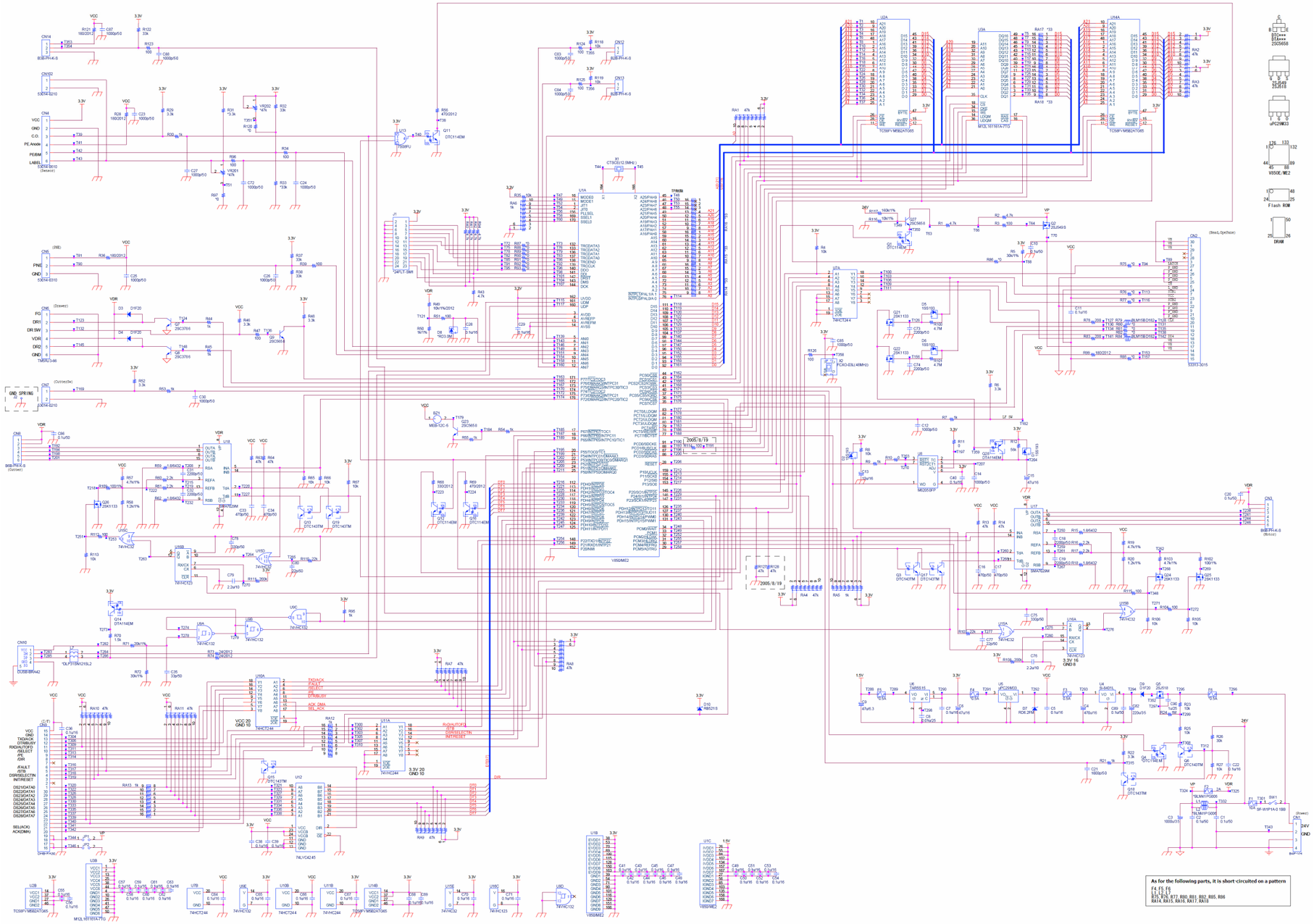
3.4.3 Parallel Interface Board



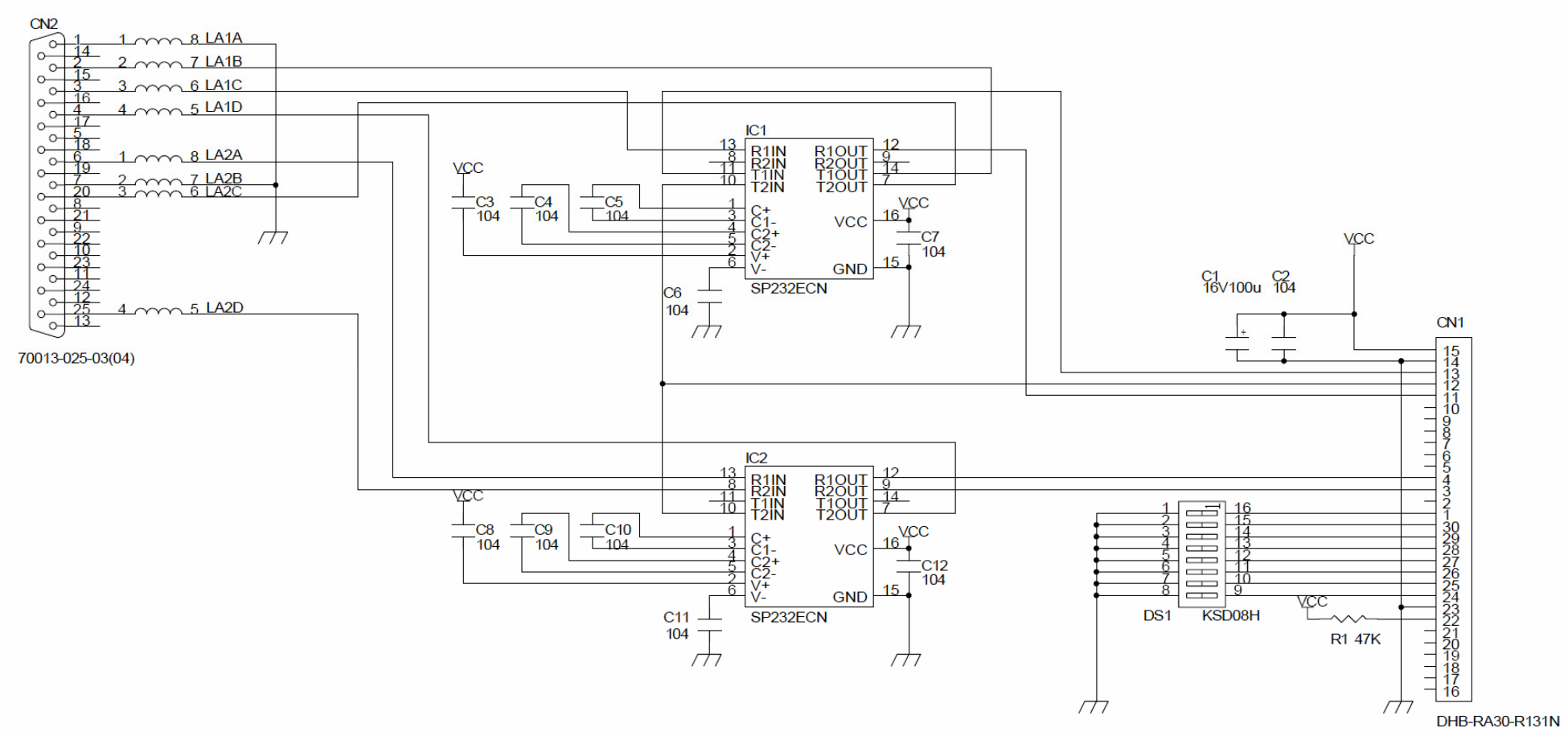


4. CIRCUIT DIAGRAM

4.1 Main Control Board


As for the following parts, it is short-circuited on a pattern
F4 F5 F6
L1 L2 L3
R76 R76 R77 R80 R81 R82 R85 R86
RA14 RA15 RA16 RA17 RA18

4.2 Serial Interface Board



4.3 Parallel Interface Board